fornia. Of the four species of *Apus* all inhabit the Central province; *Apus æqualis* lives on the plains of the Rocky mountains, and also at Matamoras, in Mexico. It is a curious fact that *Apus lucasanus* Pack., not only occurs at Cape St. Lucas, Lower California, but is also an abundant species at Ellis, Kansas. This is a parallel case to the presence of certain birds at Cape St. Lucas which, as observed by Prof. Baird, belong to the Central rather than to the Pacific province. Of the genus *Lepidurus* there are two forms (*L. couesii* and *L. bilobatus*) characterizing the plains. *L. couesii* occurs in Northern Montana, and is allied to a recently described Lepidurus from Archangel, Russia, according to Lilljeborg.

The eastern limits of the Central province extend to near the 97th meridian in Kansas and Nebraska, according to the writer's observations.

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THE REPORT OF THE COMMITTEE OF THE AMERICAN ASSOCIATION OF 1876 ON BIOLOGICAL NOMENCLATURE.

BY E. D. COPE.

IN the year 1842 the British Association for the Advancement of Science took into consideration the question of zoölogical nomenclature, and through a committee made a report, which embodies a series of recommendations in the form of rules. In 1863 another committee of the British Association revised these rules and reprinted them with various additional recommendations. This report was republished in this country with a few additional suggestive notes by Prof. A. E. Verrill, in 1869.[1] Since that date the question has been discussed by the American entomologists Scudder, Edwards and LeConte.

The rules issued at the earlier periods above mentioned dealt largely with etymological and literary questions, while admitting in general terms the necessity of observing the law of priority of date. The energy of some of the resurrectionists of obsolete works in bringing to light old names, however, soon drew attention to the importance of ascertaining the real nature of priority of date; and the close coincidence of date of some modern publications, has brought up the question from another side. The

[1] Amer. Jour. Sci. and Arts, July.

entomologists first began to handle the subject critically, the most practical article with which I am acquainted being that of W. H. Edwards.[1]

In order to establish a basis of definite action in this matter, the American Association for the Advancement of Science at its meeting in Buffalo, in 1876, appointed a committee "to obtain an expression of opinion from the working naturalists of America in regard to the nature of a set of rules for facilitating the decision of questions relating to nomenclature," etc. The committee consisted of Capt. Wm. H. Dall, of the U. S. Coast Survey, and the results of his work are now given. To my own mind the method pursued by Capt. Dall was excellent, and the results are very satisfactory as displaying a degree of unanimity among American naturalists so complete as to constitute their opinions, as embodied in Capt. Dall's report, a set of rules which no one can safely disregard on the one hand, or hesitate to follow on the other.

Capt. Dall's prefatory remarks are as follows:

In accordance with the understanding and resolutions of the Section, by which this duty devolved upon him, your Reporter prepared a circular which was printed under the supervision of the permanent secretary and circulated by the Smithsonian Institution, a copy of which is appended to this report.

The circular was sent to all who, within the last five years, might be included under the designation of publishing naturalists, and of whom the address could be obtained. This list included about eighty-five names, from a number of which (for various reasons) a response was hardly anticipated. They were used, however, in order that the fullest opportunity might be afforded to all those who might desire to express an opinion.

The responses received to date (August 14, 1877), are forty-five in number. While a few honored names, to whose views all would attribute due weight, are not on the list, yet it includes most of those whose contributions are familiar in the Proceedings of American Scientific societies, and an unquestionable majority of the best working naturalists of the country. The views of several of those from whom no response was received, have been incorporated in the appendix by means of citations from their works.

The queries contained in the circular relate chiefly to certain points, concerning which a diversity of opinion has existed among naturalists; the general principles of nomenclature not being in question. The responses are divided into affirmative, negative

[1] Canadian Entomologist, February, 1873.

and doubtful, while in individual cases some queries received no response. The answers classified as doubtful, comprise those which by their tenor indicated that the purport of the particular query had not been clearly understood, and some in which the person replying avowed his inability to express a preference for any one of several modes of proceeding.

The gratifying unanimity which is exhibited in the responses to certain of the more important and clearly defined questions at issue, indicates that a thorough study of the more complicated questions by the light of the general principles of nomenclature, would result in a practical agreement on the part of American naturalists in relation to nearly all the matters in debate.

It is evident from the responses of naturalists, that their opinion is generally adverse to any attempt to limit, by arbitrary rules, the right of publication in the most convenient direction, and against any statute of limitations in regard to scientific names. This seems to be in accord with the principles of justice, equity and general usage in nomenclature, though at times inconvenient in its results. It may be confidently expected that the majority of authors, when their attention has been drawn to it will, for their own interest as well as that of science, avoid in future publications, the methods (or want of method) which in the remote past sowed so many germs of present difficulty.

The circular with replies is preceded by the following note by Capt. Dall:

NOTE.

The question with which the working naturalist is most frequently brought face to face—and in the decision of which so much trouble is experienced and such diverse opinions are elicited—are chiefly those which involve the right of any one of several names to be considered as properly proposed and entitled to take precedence of others, provided its priority in time of application be established.

The rule that names (otherwise unexceptionable) which are prior in date, are to be accepted in nomenclature to the exclusion of all others, is conceded by all naturalists.

The rules recommended by the Committee on Nomenclature of the British Association for the Advancement of Science, have been generally adopted; though in certain details they are regarded by many naturalists as defective. Nevertheless they have largely contributed to that uniformity which is so desirable in the matter of nomenclature.

It has been thought that a similar recommendation on the part of the American Association might reach many who are not conversant with the British rules and tend to produce in the works of the rising generation of American naturalists a similarly beneficial agreement.

The differences of opinion which have arisen, are chiefly in matters of detail and intrinsically of very slight importance.

One of the most serious in its effect upon nomenclature is that in regard to what names shall be considered as really binomial; another as to what is necessary to definitely establish a name in order that if prior to any other it may be accepted as properly proposed; and most of all as to the date to be adopted as that of the beginning of binomial nomenclature. This latter question, as to facts, on the authority of De Candolle, stands as follows:

A series of rules for nomenclature was to some extent foreshadowed by Linnæus in his *Fundamenta Entomologia* of 1736. These rules were first definitely proposed in the *Philosophia botanica*, which appeared in 1751. These rules, however, related almost exclusively to the generic name or *nomen genericum*. In 1745, he had employed for the first time a specific name (*nomen triviale*) composed of one word, in contradistinction to the polynomial designation of a species (*nomen specificum*) which was previously the rule among naturalists. That which now seems the most happy and important of the Linnæan ideas, the restriction of the specific name as now understood, seems to have been for a long time only an accessory matter to him, as the *nomina trivialia* are barely mentioned in his rules up to 1765.

In 1753, in the *Incrementa botanices*, while expatiating on the reforms which he had introduced into the science, he does not even mention the binominal nomenclature. In the *Systema Naturæ*, Ed. X, 1758, for the first time the binominal system is consistently applied to all classes of animals and plants (though it had been partially adopted by him as early as 1745), and hence many naturalists have regarded the tenth edition as forming the most natural starting point. The system being of slow and intermittent growth, even with its originator, an arbitrary starting point is necessary. In the twelfth edition (1766–68), numerous changes and reforms were instituted, and a number of his earlier specific names were arbitrarily changed. In fact, Linnæus never seems to have regarded specific names as subject to his rules.

The last was recommended by the British Committee as the starting point. They have since, however, receded to the extent of admitting to recognition some ichthyological works printed between the dates of the tenth and twelfth editions.

The circular with the appended replies is as follows:

QUESTIONS TO WHICH AN ANSWER IS DESIRED.

I. What date shall be taken as the commencement of the binomial era in nomenclature? For Ed. X, 18. Ed. XII, 17. 1736, 1. Botanists, 1753, 2. No answer, 7.

II. Shall phrases composed of two words which may appear in the publications of naturalists whose works

preceded, or who did not in such works adopt the binomial system of nomenclature, be considered as binomial names? No, 32. Yes, 5. No answer or doubtful, 8.

III. If so, shall the first word of the said phrase be entitled to recognition as a generic name? No, 32. Yes, 5. No answer or doubtful, 8.

IV. If an author has not indicated his adoption of the binomial system by discarding all polynomial names in a given work, are any of his names therein entitled to recognition otherwise than in bibliography? No, 18. Yes, 18. Doubtful, 4. No answer, 5.

Example. Da Costa in his work on the Conchology of Great Britain, varies from binomial to polynomial in his designations of species, and some of his "generic" names contain two or three words, while others apparently conform to the Linnæan system. Should any of these names be retained?

V. Does the reading of a paper before a scientific body constitute a publication of the descriptions or names of animals or plants contained therein? No, 39. Doubtful, 2. Yes, 4.

VI. Is a name in the vernacular of the publishing author, or a vernacular rendering from a classical root unaccompanied by a Latin or Greek form of the name, entitled to recognition except in bibliography? No, 36. Doubtful, 2. Yes, 4. No answer, 3.

VII. Is a name applied to a group of species without a specification of any character possessed by them in common (that is, without any so-called generic diagnosis or description), entitled to recognition as an established generic name by subsequent authors? No, 38. Doubtful, 3. Yes, 3. No answer, 1.

VIII. Is a generic name applied to a single (then or previously), described species without a generic diagnosis or description of any kind, entitled to recognition as above, by subsequent authors? No, 37. Doubtful, 3. Yes, 4. No answer, 1.

IX. Is a name, when used in a generic sense, and otherwise properly constituted, subject to have its orthography changed by a subsequent author, on the ground that a proper construction from its classical roots would result in a different spelling? No, 21. Doubtful, 3. Yes, 19. No answer, 2.

X. If the previous question be answered in the affirmative, it may be further enquired whether an author has a right to assume that a given name is derived from classical roots, when the author of the name did not

so state, and on this assumption to proceed to change the said name to make it agree with the assumed proper construction in any case? and especially when by the asserted reformation the generic name becomes identical with one previously proposed for some other animal or plant, and hence will fall into synonymy? No, 25. Doubtful, 2. Yes, 6. No answer, 12.

Example. Schumacher described a genus which he called *Paxydon*, giving no derivation. A subsequent author described a genus *Pachydon*, giving the derivation. A third writer assumed that Schumacher's name had the same derivation as *Pachydon*, and that both, if correctly written, would be *Pachyodon*. The last mentioned then proposed a new name for *Pachydon*, which he had thus made to appear preoccupied. Was this allowable? No. 26. Doubtful, 3. Yes, 8. No answer, 8.

XI. Should a generic name, otherwise properly constituted, but derived from the specific name of its typical species, or similar to that of one of the species included under it, be rejected on that account? No, 40. Doubtful, 4. Yes, 1.

Note. It is proper to state that this is an important question, since Linnæus himself, and others, formed many generic names in this manner, and a large number of such names are currently accepted, especially in botany and among vertebrate animals.

XII. Shall a subsequent author be permitted in revising a composite genus (of which no type was specified when it was described) to name as its type a species not included by the original author of the genus in that latter author's list of species given when the genus was originally described? No, 37. Doubtful, 2. Yes, 5. No answer, 1.

Example. Linnæus described a genus *Chiton* with a very few species. After many species had been described by others, a later author divided the genus into a number of genera, and reserved the name of Chiton (restricted) for a species described many years after the death of Linnæus and belonging to a section of the *Chitonidæ* unknown to Linnæus; while to the Linnæan chitons he gave new appellations.

XIII. When an old genus without a specified type has been subdivided by a subsequent author, and one of the old species retained and specified to be the type of the restricted genus bearing the old name,—is it competent for a third author to discard this and select another of the original species as a type, when by so doing changes are necessitated in nomenclature? No. 39. Doubtful, 4. No answer, 2.

XIV. Shall an author be held to have any greater control over or greater privileges with relation to names of his own proposing, after the same have been duly published, than any other subsequent author? No, 40. Doubtful, 2. Yes, 2. No answer, 1.

XV. For instance, when an author describes a genus and indicates a species as its type, is it allowable for him subsequently to substitute any other species as a foundation for his genus, or to use the original type as a foundation for another new genus? No, 38. Doubtful, 1. Yes, 2. No answer, 4.

XVI. If an author describes a genus and does not refer to it any then or previously described existing species, can the genus be taken as established? No, 33. Doubtful, 7. Yes, 1. No answer, 4.

XVII. If an author applies a specific name to an object without referring it to some then or previously described genus, is the specific name entitled to recognition by subsequent authors? No, 33. Doubtful, 4. Yes, 7. No answer 1.

XVIII. When a generic name has lapsed from sufficient cause into synonymy, should it be thenceforth entirely rejected from nomenclature? or should it still be applicable to any new and valid genus? Reject, 19. Accept, 23. Doubtful, 1. No answer, 2.

XIX. Should a name which has been once used in one subkingdom, and has lapsed into synonymy, be considered available for use in any other if not entirely rejected from nomenclature? No, 20. Doubtful, 1. Yes, 18. No answer, 6.

XX. Should a name be liable to be changed or a later one substituted for it, if the original be supposed to be inapplicable or contradictory of the characters of the species or genus to which it was applied? No, 28. Doubtful, 3. Yes, 13. No answer, 1.

Example. A fish without teeth was named *Polyodon*, which name had come into use; when a later author substituted *Spatularia* on the ground that *Polyodon* was inapplicable.

XXI. Is it advisable to fix a limit of time, beyond which a name which had been received without objection during that time shall be held to have become valid, and no longer liable to change from the resuscitation of obsolete or uncurrent but actually prior names? No, 28. Doubtful, 1. Yes, 13. No answer 3.

XXII. If so, what shall this period be? No answer, 35. The others range from 10 to 100 years.

XXIII. Should it be permitted to alter, or replace by other and different appellations, class, ordinal and family names, which owing to the advance of science and consequent fluctuation of their supposed limits have become uncharacteristic? Yes, 30. Or should these

also be rigidly subject to such rules of priority as might be determined on for generic or specific names? No answer, 4. Yes, 11.

XXIV. Should or should not absolute certainty of identification be required before it be permissible to reject a modern and generally adopted name in favor of a prior but uncurrent designation? Yes, 38. Doubtful, 2. No answer, 5.

Note.—Many of the old descriptions of species sufficient for identification when few species were known, are entirely insufficient at the present day to distinguish between allied species. Should, therefore, a modern specific name with a recognizable description be made to yield to an older name unless the identification can be made beyond any cavil?

XXV. Is it desirable to adopt any classification of periodical literature by which certain exclusive channels for publication of descriptive papers in natural history shall be designated for use by authors who desire to secure the rights of priority for new names proposed by them? No, 26. Desirable but impracticable, 9. Yes, 8. No answer, 2.

Note.—An affirmative answer will imply that names which may be proposed through other than the designated channels, after the latter shall have been decided upon, shall not be entitled to recognition in questions of priority.

XXVI. Is it desirable to adopt any analogous rule in relation to the character or extent of distribution of any independent publication or pamphlet to which it must conform, on pain of losing its right to recognition? No, 21. Desirable but impracticable, 10. Yes, 14.

Note.—If the answer to either or both of the two preceding questions be affirmative, a note specifying the nature of the proposed classification or restrictions may be appended to this list.

XXVII. Should a series of rules be recommended for adoption by the Association, would you be guided by these recommendations in cases where they might not agree with your own preferences? Yes, 29. Yes, with reservations, 15. No, 1.

LIST OF NATURALISTS FROM WHOM REPLIES TO THE CIRCULAR HAVE BEEN RECEIVED.

J. A. Allen, Museum of Comparative Zoölogy.
W. G. Binney, Burlington, N. J.
Richard Bliss, Jr., Cambridge, Mass.
Dr. Thomas M. Brewer, Boston Society of Natural History.
Dr. P. P. Carpenter, McGill University.
S. F. Clark, Johns Hopkins University.
T. A. Conrad, Philadelphia Academy of Natural Sciences.

Dr. J. G. Cooper, California.
Prof. E. D. Cope, Philadelphia.
W. H. Dall, Smithsonian Institution.
Prof. J. D. Dana, Yale College.
Dr. J. W. Dawson, McGill University.
W. H. Edwards, West Virginia.
S. W. Garman, Museum of Comparative Zoölogy.
Dr. T. N. Gill, Smithsonian Institution.
Dr. Asa Gray, Harvard University.
A. R. Grote, Buffalo Academy of Sciences.
Dr. Herman Hagen, Museum Comparative Zoölogy.
Dr. Geo. H. Horn, Philadelphia.
Prof. Alpheus Hyatt, Boston Society of Natural History.
Ernest Ingersoll, New York.
W. P. James, Cincinnati, Ohio.
Prof. D. S. Jordan, Indiana.
Dr. J. L. LeConte, Philadelphia Academy of Natural Sciences.
Dr. Joseph Leidy, Philadelphia Academy of Natural Sciences.
Dr. James Lewis, Mohawk, N. Y.
Theodore Lyman, Museum of Comparative Zoölogy.
T. L. Mead, New York.
S. A. Miller, Cincinnati, Ohio.
Dr. A. S. Packard, Jr., Peabody Academy of Sciences.
F. W. Putnam, Museum of Comparative Zoölogy.
Prof. C. V. Riley, U. S. Entomological Commission.
Prof. C. Rominger, State Geologist, Michigan.
Dr. J. T. Rothrock, University of Pennsylvania.
S. H. Scudder, Cambridge, Mass.
Prof. N. S. Shaler, State Geologist of Kentucky.
Herman Strecker, Reading, Pa.
Prof. Cyrus Thomas, U. S. Entomological Commission.
Geo. W. Tryon, Jr., Philadelphia Academy of Natural Sciences.
P. R. Uhler, Peabody Institute, Baltimore.
Sereno Watson, Harvard University.
Dr. C. A. White, U. S. Survey of the Territories.
J. F. Whiteaves, Palæontologist to the Canadian Geol. Survey.
Prof. R. P. Whitfield, Amer. Museum of Natural Hist., N. Y.
Dr. H. C. Yarrow, United States Army.
Two accidentally unsigned.